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ABSTRACT

Productive application of linguistics to the field of reading has made necessary the formulation, revision, and expansion of theories and models of reading to incorporate relationships among stimulus characteristics of writing systems and response components of phonological, morphological, syntactical, lexical, and affective systems. These variables are mobilized and organized according to the purposes of the reader in order to process and transform surface characteristics of oral or printed stimuli into a structural form and level that could result in a semantic interpretation. Reviewed herein are selections from the voluminous research evidence leading to these changes in theories and models of reading and implications of this evidence for reading theory and practice are discussed. (A 121-item bibliography is appended.) (Author/RD)

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Language, Linguistics, and Learning to Read

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Language, Linguistics, and Learning to Read

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Prior to the revolution in linguistics theory wrought by structural and transformational-generative grammars (Bloomfield, 1933; Chomsky, 1957) language, linguistic theory, and their modes of inquiry played little, if any role in reading theory, research, or instruction. With the exception of immaturity in vocabulary, memory, and other intellectual functions that participate in speech, oral language development was thought to have become asymptotic to a mature level of linguistic ability about age five (McCarthy, 1954). Since formal reading instuction was not initiated until age six, oral language ability was therefore considered irrelevant for explaining individual differences in acquisition of reading behavior, particularly as word meaning and sentence length, essential indices of reading difficulty, were controlled in basal readers, well within the linguistic ability of probably all beginning readers. Consequently, it was believed that the only new component in learning to read was acquisition of ability to perceive and process printed stimuli. However, recent research indicates that oral language development, including grammatical interpretation, continues at least throughout the elementary grades (Menyuk, 1963; C. Chomsky, 1970; Loban, 1963; Strickland, 1962; Ruddell, 1966, 1970).

The civil rights revolution also led to a more active role for linguistics in the field of reading by focusing attention on the relatively low achievement of Black and Chicano and other minority groups. Bilingual and dialectal differences between these groups and the majority group began to be suspected as a prime cause of low reading

achievement in minority groups, (Baratz, 1969; Baratz and Shuy, 1969; Goodman, 1965, Stewart, 1969; Wolfram, 1970; Singer, 1956; Entwisle, 1971; Lucas and Singer, 1972) and linguistic analyses were then made of these dialects (Labov, 1965, 1969, 1970). Linguistic theory and inquiry were also brought to bear on other aspects of reading, such as the relationship between the writing system and reading acquisition (Gelb, 1963; Venezky, 1967, 1970; N. Chomsky, 1970; Gillooly, 1971) and the interrelationships among oral language, reading, and writing (Reed, 1965, 1970; C.S. Chomsky, 1970).

Productive application of linguistics to the field of reading made it necessary to formulate, revise, and expand theories and models of reading to incorporate into them the interrelationships among the stimulus characteristics of writing systems and the response components of phonological, morphological, syntactical, lexical, and affective systems. These systems are mobilized and organized according to the purposes of the reader in order to process and transform the surface characteristics of oral or printed stimuli into a structural form and level that could result in a semantic interpretation (Singer, 1969; Ruddell, 1970; Goodman, 1965, 1972).

The affective domain may be the next frontier of research in reading. Exploration in experiential responses to and affective components associated with reading have already attracted theoretical and research interests (Russell, 1970; Rosenblatt , 1968; Athey, 1965, 1970; Athey and Holmes, 1969).

The resulting insights gained from this research and its resulting revision in theories and models of reading have increased our understanding of man's ability to transcend time and space through the

medium of the printed word. This understanding is also enhancing methods and materials of instruction for making a difference in reading acquisition and performance (Ruddell and Williams, 1972; Corder, 1971).

The research evidence that has led to these changes in theories and models of reading are voluminous (Singer and Ruddell, 1970; Davis, 1971; Corder, 1971). Only some of it can be reviewed here. I shall briefly review some selected research on language development, writing systems, dialect and the reading process, and then draw some implications for classroom practice.

Review of Research

Language Development

Language development appears to be a function of cognitive processing operations in productive interaction with a linguistic environment, and this developmental interaction continues as the brain matures (Athey, 1971; Lenneberg, 1967; Slobin, 1966b). During the first year of life, the child babbles a universal range of sounds that gradually converge towards the set of distinctive features presented by his linguistic models. At the age of 12 months, the average child can say two words (Bayley, 1949), which may be holophrases, single words that express sentences of meaning.

The gradient of vocabulary remains low from age one to two, as the child, still in a sensori-motor stage of cognitive development, learns perceptual invariants of time, space, and motion. By 18 months, the child has acquired a 200 to 300 word vocabulary and acts as though

he has a grammatical rule for generating two-word sentences (Braine, 1963; McNeil, 1966). His grammatical rule and indeed his entire grammatical development is not a direct imitation nor a corruption of adult speech, but instead is an active construction, reflecting his level of intellectual maturity; in fact, Menyuk (1963) observed that the child exhibits difficulties in imitating utterances that are not based upon prior ability.

By age three, the child uses plurals (Ervin and Miller, 1963) and has progressed through three stages of development in the use of the interrogative (Bellugi, 1965). During the next three years, the child's vocabulary accelerates to approximately 2500 words. Past-tense and intention appear between ages 3-4 (Ervin-Tripp, 1970). As early as age four or five, the child uses all parts of speech and has unconsciously learned and intuitively uses rules of grammar to express his ideas and manipulate his vocabulary into a variety of utterances, including clauses (Smith, 1926; McCarthy, 1954; Ervin and Miller, 1963).

At age six, reflecting changes in his cognitive development, the child tends to overgeneralize grammatical rules. For example, recently acquired rules for regular verbs, such as the past tense rule, are applied to all verbs, including irregular verbs that had been previously learned as single items and correctly used, but are now regularized and incorrectly formulated, such as "goed," "drunked," or "wetted." At this age, the average child has his phonemes under control except for sibilants, a voiced interdental, and a semi-vowel (hw) (Hodges, 1970). He can communicate effectively with his peers and adults, provided the intended meaning of the communication does

not exceed his mental capabilities and experientially based concepts (Strickland, 1962; Singer, 1966; Goodman, 1966). Indeed, upon entrance to school, the average child, although not yet mature in vocabulary, memory ability, or cognitive level (Flavell, 1963; Bruner et al, 1966; Piaget, 1970) has a competence for generating novel grammatical sentences that approaches adult competence (Smith and Miller, 1966; McNeil, 1966), and tends to use his semantic and syntactic abilities in reading performance as early as the first grade level (Weber, 1970b).

Linguistic competence and performance continue to develop throughout the elementary years. Loban (1963) discovered that linguistic fluency increases each year. After the third grade, coherence of speech improves as a result of decrease in incidence and length of mazes ("tangles" of language). Improvement and control of language is not attained through changes in pattern of communication unit, but by degree of flexibility, expansion, and elaboration of units within one pattern. Children who are superior in control over their communication units also exhibit a greater degree of subordination, are more sensitive to language conventions, score higher on vocabulary and intelligence tests, and perform better in reading and writing. Although those who are least proficient in language tend to improve throughout the grades, the gap between the least and the most proficient widens.

Strickland (1962) also found significant relationships throughout the grades between structure of oral language and reading ability. At the second grade, superior readers used greater sentence length in oral language productions. At the sixth grade level, those who were high in

oral and silent reading used greater sentence length, made more use of movables and subordination, had fewer short utterances, and used more common linguistic patterns in speech productions. In oral reading, the better readers were freer of errors. They were more fluent and used more appropriate phrasing and intonation. But, Strickland found that basal readers did not provide systematic control over sentence pattern and grammatical structure. When Ruddell (1965) did match fourth grader's text to their oral language sentence structures, controlling difficulty level, reading comprehension scores were significantly higher than on unmatched paragraphs.

Although the child is fairly competent at age six, grammatical development still continues. Carol Chomsky (1972) claims these developments follow a regular sequence of stages and represent a gradual reduction in disparity between child and adult grammar. The constructions involved in the five stages of acquisition of syntax during the elementary school years are represented by such constructions as "easy to see" in "The doll is easy to see" and "promise" in "Bozo promises Donald to lie down" and "ask" in "The girl asks the boy what to paint" and "although" in "Mother scolded Gloria for answering the phone, although I would have done the same." To correctly interpret the sentence and determine the deleted noun or verb phrase, Chomsky explains that "the child who had learned to choose the nearest preceding candidate in the surface structure of the sentence must recover the deleted items from the sentences' deep structure." Whether semantic complexity, as favored by Slobin (1966), or grammatical difficulty, as championed by C. Chomsky (1972) determines the developmental sequences represented by these stages is a current controversial

issue (Wardhaugh, 1971).

Various theories have been proposed to explain the facts of language development. Athey (1971) and Wardhaugh (1971) identified behavioristic, nativistic, cognitive, psycholinguistic, and information processing theories of language development, and three language-based models of reading, Ruddell's (1970), Goodman's (1970), and Brown's (1970). After reviewing the theories and the research literature, Wardhaugh concluded that behavioristic theories do not adequately account for the facts of language development for the following reasons: in addition to Chomsky's devastating critique of Skinner's verbal learning and verbal behavior theory, Maccorquodale's (1970) reply notwithstanding, he also cited the inability of children to imitate adult utterances that do not represent prior ability, the lack of a high correlation between word frequency and initial vocabulary acquisition, and linguistic generalizations which cannot be explained in relation to input data. Of all the theories, Wardhaugh believed Slobin's psycholinguistic theory to be most promising.

Slobin (1966a, 1966b) accepts Lenneberg's (1967) concept that language is a species-specific factor. But in contrast to McNeil's view (1966) Slobin thinks that linguistic universals are not innate content. Instead, Slobin's "Language Acquisition Device" for filtering and transforming incomplete and inadequate input into rule-ordered grammatical competence is the result of a cognitive processing mechanism. Development of language is thus controlled by cognitive abilities, such as memory storage, information processing, etc. These abilities increase with age and enable the individual to actively learn certain conceptual and semantic categories, which are the bases

for the formation of syntactic structures and linguistic behavior that appears to be rule-governed.

Essentially in agreement with Wardhaugh, Athey (1971, p. 14) ends her evaluation of language models and reading with this conclusion:

> In essence, if the approach to understanding reading through the medium of theoretical models is a viable one, what seems to be called for is a cognitive theory (e.g. Piaget or Bruner), or a psycholinguistic theory that leaves room for learning (e.g. Slobin) or some composite of the two. Other theories such as that of Lenneberg or of the advocates of the information-processing approach, provide additional insights from the perspective of other disciplines, but the foundation lies essentially in some form of cognitive theory...

But, theories and models of language cannot be directly applied to reading because they are not identical in development, structure, or function. Oral language and reading acquisition, as Wardhaugh (1971) and others (Staats and Staats, 1962; Carroll, 1966; and Natchez, 1967) have stated, contrast in expected rate of acquisition, level of anxiety during acquisition, consciousness and deliberatedness of instruction, delay in reinforcement, and modalities involved in the processes. Within the receptive modalities, listening also differs from reading in locus of control over speed of processing stimuli, memory capabilities, degree of linguistic redundancy and formality, availability of supra-segmental and extralinguistic cues, and impact of social relationships and context (Singer, 1965a; Ruddell, 1966; Singer, 1967). Yet, even though "writing is not simply speech written down" (Wardhaugh, 1971, p. 190), an individual learns to relate phonological, morphological and lexical components to the functional units and spelling patterns of the writing system.

Writing System

English orthography is not an irregular or unlawful communication system (Gibson, 1965; Venezky, 1967; C. Chomsky, 1970; Gillooly, 1971). Nor is its 26 letter alphabet inadequate for representing some 46 phonemes; indeed, its combination of some 65 functional units is more than adequate (Venezky, 1967, 1970a, 1970b; Cronnel, 1971). Moreover, speech and writing are correlated but different representational systems, both related to common linguistic forms (Reed, 1965). English orthography is therefore regular but more complex than a phonetic or phonemic system. That is, rules exist, but the correspondence is between letters or letter sequences and morphophonemic structures. In short, English orthography represents elements of meaning (morphemes) as well as elements of sound (phonemes). Although this complexity may slow the rate of acquisition of correspondence rules, it does have compensatory advantages for rate of comprehension because spelling-meaning relationships are maintained for a large class of words which undergo a vowel shift in speech, but not in spelling. This vowel shift occurs, for example, in the words "nation" and "nationality." In reading, the addition of the suffix signals a vowel and form class change, but the lexical spelling is maintained (Chomsky and Halle, 1968; N. Chomsky, 1970; Gillooly, 1971).

Also, English orthography has an inherent advantage of greater dialect adaptability than a more phonetic or phonemic writing system because English orthography does not necessitate total phonological processing in order to relate graphic input to lexical forms. Consequently, English orthography may be more appropriate for the wide range of regional, social and ethnic dialects than some transitional

writing alphabet such as the readers printed in the initial teaching alphabet (i.t.a), which are keyed to a composite of four dialects spoken in Great Britain (Gillooly, 1971). Moreover, Chomsky (1970) has claimed that only to the extent that dialects differ at the syntactic and lexical but not at the phonological levels should they be a source of difficulty in reading English orthography. For all of these reasons, Chomsky has cited English orthography as a near-optimal representational system.

If we accept the validity of Chomsky's claim, then what we have to learn is how to exploit these properties of English orthography in teaching reading and spelling. For example, the word frequency principle for selecting and sequencing words used in most basal readers does not capitalize on the spelling-meaning aspect of English orthography in teaching reading. The hypothesis that such a capitalization may be beneficial to those whose dialect diverges significantly from "standard" English needs to be tested (Ives and Ives, 1969; C. Chomsky, 1970; Gillooly, 1971). This instructional input may also be advantageous to the reading acquisition behavior of children who speak "standard" English because the dual structure of English orthography would develop both lexical and phonological correspondences whereas a more phonemic or phonetic writing system would tend to emphasize only phonological correspondence. Indeed, this hypothesis could explain why a group taught by the initial teaching alphabet was superior on word recognition to another group taught by English orthography but on paragraph comprehension there was no difference (Gillooly, 1971). The hypothesis that needs to be tested is that the group taught by English orthography offset its word recognition

disadvantage by compensation in development of spelling-word meaning relationships (Singer, 1971).

Further comparison of the effects of a simulated transitional writing system on reading achievement can be gleaned from Ruddell's (1965b, 1968) comparison of Sullivan's programmed instruction with its sequence of regularly spelled words versus a basal reader method of instruction with its word frequency selection. In the first year of the program, the advantage was to Sullivan's program, but the opposite was true the second year. The explanation again might be that the Sullivan material was primarily developing phonological correspondence rules which facilitated word recognition development in the initial stage, but the basal reader was developing more complex phonological and lexical correspondence rules which paid off over the long run.

Dialect

There is a far greater mismatch in the correspondence between text and minority dialects. But, whether dialect interferes with reading acquisition is not just a function of orthography or whether the dialect divergence is lexical or syntactical. The relationship between dialect and reading achievement is also a function of how teachers present stimuli and evaluate responses. For example, Melmed (1971) demonstrated that black children performed lower on auditory discrimination of words which included homonyms in black phonology (sick, six) when presented in isolation, but did not differ significantly from whites on oral and silent reading when these same homonyms were presented in context. Furthermore, there may be less of a relationship

between dialect and reading than we suppose: Mitchell-Kernan (1969) reported that syntactic variations in speech of Black English were not related to difficulties in comprehending standard English; also, lower-class black pupils are capable of understanding their own dialect and their teacher's,but white teachers are less proficient in understanding black dialect.

In general, there is a mismatch between the dialect of all children and the text because the widely-used basal reader is written in a dialect unfamiliar to all children (Weber, 1970a), yet most children apparently adapt and achieve expected progress in reading. Indeed, dialect differences may be overemphasized by some teachers as a cause of poor reading (Crowl and McGinitie, 1970), or teachers may have low expectations for speakers of low-status dialects and attribute their "errors" to linguistic deficiency (Goodman, 1970).

Actually Black English is an "adequate language, well-ordered, structured, and developed" (Wardhaugh, 1969). What the teacher may misconstrue as an error may be merely a recoding or encoding of the message into black dialect. Even so, less black dialect is used for reading reception and encoding than for oral production (Rosen and Ortego, 1969). In general, whether the child is making a dialect or a real "error" should depend on knowledge of Black English (Labov, 1969) and the child's comprehension. If the child recodes or encodes in his own dialect, but demonstrates comprehension of the message, then it is more likely to be merely dialect recoding or encoding, not an error response.

What may be categorized as a dialect difficulty could sometimes be a confounding of Black English with a "restricted code" (Bernstein,

1970). That is, the language of lower class homes and middle-class dominated schools may represent a discontinuity in style of communication, as well as in curriculum (Strodtbeck, 1964). Used to extralinguistic situational signs to facilitate interpretation of a restricted code, the lower class reader may be at a disadvantage with his middle class Anglo peer who is inured to verbal context (Entwisle, 1971). However, as a working hypothesis, one remedy would be to maximize extralinguistic cues during instruction: use pictures, stress intonation patterns (Lefevre, 1964), or give children dramatic type instructions for generating various responses to graphic stimuli (Martin, 1966).

Various strategies have been formulated for teaching dialectally different children, including use of a language experience approach (Cramer, 1971), teaching the child to read his own dialect first (Baratz and Shuy, 1969), using "neutral materials" (Goodman, 1965), acceptance of recoding(Wolfram, 1970) or teaching standard English before instituting reading instruction (Modiano, 1968; Rystrom, 1970). So far, there has been no real test of the alternatives for black children (Baratz, 1971), but some tests have been conducted on Chicano children (Yoes, 1967; Rosen and Ortego, 1969; Feeley, 1970; Ramirez, 1970).

However, the validity of the tests is difficult to assess because dialects tend to merge into bilingualism, especially for Chicano and some other minority groups whose backgrounds include another language (Singer, 1956; Lucas and Singer, 1972). Nevertheless, for these minority groups it may be critical to have an adapted or compensatory curriculum or summer session program in the primary grades that will

enable them to attain a level of reading ability at which their reading achievement can become cumulative in a normal curriculum as early as possible (Ruddell and Williams, 1972; Singer, 1972).

Reading Process: Acquisition and Development to Maturity

Linguistic analysis has also led to insights into the reading process. Individuals appear to discriminate letters according to their distinctive features and act as though they had rules for grapheme-phoneme relationships. But, it is doubtful whether the process necessarily involves recoding to speech and then responding to the recoded stimulus as a hearer would to auditory perceptions because deaf children's reading behavior appears to exhibit the same rule-governed phonographic correspondence as that of normal hearing subjects (Gibson, 1965). Whether the beginning reader has to recode to speech could depend on how he is taught (Buswell, 1945; Singer, 1968). But, regardless of his initial reading acquisition process, as he matures in reading, he tends to shift to a process of sampling the text in a search for information (Hochberg, 1970) or to a reduction in uncertainty (Smith, 1971). Drawing upon his "word sense" (Holmes, 1954) or upon his knowledge of linguistic constructs and redundancies, the reader forms expectancies at the letter, word, and phrase level that are confirmed by printed stimuli and by constraints at the orthopraphic, context, and intrasentence levels, respectively. Wanat (1971) characterizes this process as a chaining of alternations from stimulus to context and back to stimulus with hypothesis or expectations forming and being confirmed throughout the process.

Some theoretical insight into a cause of the rate of change in

this developmental reading process has been formulated by C. Chomsky (1970). She has argued that the lexical representation of English orthography could be more systematically exploited to facilitate an early shift from phonological processing of stimuli to "lexical reading." That is, instead of first orally reconstructing the printed message through phonological processes to attain a surface structure phonetic representation and then associating meaning in ways analogous to listening comprehension, lexical reading avoids phonological processing and goes more directly to underlying forms and then to a semantic interpretation. She hypothesizes that some readers may not have progressed from phonological processing to lexical reading as rapidly as they could have because in the initial stage of learning to read they assume that there is letter sound regularity, an assumption they must "abandon for the more realistic view of spelling regularity based on word relationships and underlying lexical similarities" in order to eventually interpret written symbols as corresponding to more abstract lexical representations. Lack of this transition may be a consequence for some poor readers, in part, because of their immature phonological system and inadequate stock of morphemes and lexicon.

To facilitate a shift from phonological to lexical interpretation of the spelling system, she stresses further development of the child's phonological system and phonological processing in decoding written English. For this purpose, she advises discussing "word families" in order to emphasize the range of pronunciations associated with spelling patterns. This teaching strategy may also optimize development of morphological and lexical systems. Then, as soon as vocabulary

development permits it, shifting to word-groups like "history-historical-historian" to show how different endings affect the pronunciation of the root and to demonstrate maintenance of the correspondence between the root and its lexical forms. With progress in directly relating English orthography to lexical forms, a reader could become a truly silent reader, minimizing phonological processing, and consequently reading almost entirely at the lexical level.

This explanation and input strategy might help resolve the controversy over oral reconstruction or reading mediated by speech as a necessary first stage in reading (Gibson, 1965; Biemiller and Levin, 1968). It may also help explain why some investigators and theorists have identified two types of readers, auditory-motor and visual (Huey, 1901; Bower, 1970; Hochberg, 1970). That is, some individuals may be in one category or the other because of some personal characteristics, but another reason could be based upon the assumption that the auditory-motor type represents an oral reconstruction stage while the visual type has progressed to a more mature stage of silent reading ability in which his process of reading does not require phonological processing and converting orthographic forms to the surface phonetic level, but can relate such forms more directly to the lexical level.

Summary and Implications for Reading Theory and Practice

Linguistic inquiry over the past 15 years has increased our knowledge of the facts of language development and provided evaluative criteria for determining adequacy of theoretical interpretations of these facts. From this body of knowledge, we can abstract implications for reading theory, research, and practice:

Evidence on language development indicates that the average child has a well, but not completely developed oral communication system at age six when formal instruction is initiated. Whether direct instruction, such as sentence expansion (Wardhaugh, 1971), will accelerate this development is problematical. But, such a stimulating language environment will at least provide the child with necessary input data for abstracting, constructing, and reconstructing his degree of linguistic competence as his cognitive processing mechanisms and other capabilities mature and develop (Slobin, 1968). Also, since matching text to oral language sentence structure is likely to facilitate comprehension (Ruddell, 1965a), an acquisition procedure, such as the language-experience approach is indicated, but this approach should be balanced with a pacing procedure to promote development of language processing ability.

Linguistic and cognitive, as well as other components, such as perceptual, affective, and physiological, enter into functional relationships with each other and with orthographic stimuli as the individual acquires competence and performs in reading. The evidence suggests that at least in the initial state of reading development the graphophonological relationships appears to be superior. For example, Ruddell (1968) found when instruction in syntax and morphemes was added to Sullivan's primarily phonological approach, children's reading ability improved as compared with reading achievement obtained through programed instruction or basal reader alone, and over a two year period the basal reader was superior to programed instruction. Better teachers might be developing more competent and better performing readers by similarly providing comprehensive instruction for all the

necessary subsystems and for adapting instruction to individual differences in children's styles of learning. Perhaps this rationale might account for the wide variation within method of instruction found in the First Grade Studies (Bond and Dykstra, 1967; Singer, 1968).

The theoretical as well as practical hypothesis that needs to be investigated is whether diverse input programs eventually converge on the same mental organization for reading, or whether there are persistent differences in reading behavior or processes as a consequence of initial type of input (Singer, 1968). Carol Chomsky's hypothesis that capitalizing on the lexical-spelling aspect of English orthography will facilitate progress from more phonological to more lexical, or from oral reconstruction or a speech-mediated process to a more direct route for decoding the intended message needs to be tested not only with children, in general, but also with such known groups as dialectally different children. Likewise, Bloomfield's (1942) hypothesis on orthographic regularity and Fries' (1963) hypothesis on contrastive spelling patterns need to be tested on known groups. Some experimentation with these hypotheses have already been conducted (Skailand, 1970) but much more experimentation is needed. Perhaps we will discover when and how and for whom we should adapt input systems to individual differences among children, as Bond (1935) and Fendrick (1935) had once tried to do but with less adequate control over the input stimuli.

We now realize that as individuals mature in reading, they quantitatively and qualitatively reorganize the factors mobilized for attaining speed and power of reading (Singer, 1964, 1965).

Moreover, they attain greater control and flexibility over their reading process and can shift from graphophonological to grapholexical reading or from systematic, sequential reading to sampling of the text in search of information, hypothesis confirmation, or reduction of uncertainty. Such control may be related to instructional procedures for developing active readers who learn to formulate questions, develop expectations, and read to answer their own questions (Singer, 1971). Strategies have to be devised for maximizing the development of an active, critical, and inquiring reader. Progress has already been made in this direction; particularly well known is the SQ3R method, which was devised as a study skill, but which can be adapted to general reading instruction (Robinson, 1961; Gilbert, 1956). Some cognitive instructional strategies have also been formulated (Taba, 1965; Taba et al., 1964) and tested in reading instruction (Ruddell and Williams, 1972). Also, children can probably be taught to utilize more effectively and efficiently the linguistic markers, signals, determiners, and other cues to reading comprehension, as McCullough (1972) has suggested.

To translate these hypotheses into classroom practice will require several stages of development before they are in a form useable by teachers. Materials will have to be constructed, teaching strategies devised, lesson plans and teacher manuals prepared before the hypotheses can be tested under controlled classroom situations. If this procedure is followed, then we are likely to find that basic research will be translated into classroom practice (Singer, 1971).

Ames, Wilbur S.; Carl L.; and Olson, Arthur V.
The effects of nonstandard dialect on the oral reading behavior of fourth grade black children. In Carl Braun (Editor), Language, Reading and the Communication Process. Newark, Delaware: International Reading Association, 1971.

Athey, Irene J.
Reading-Personality Patterns at the Junior High School Level. Doctoral Dissertation. Berkeley: University of California, 1965.

Athey, Irene J.
Affective factors in reading. In Harry Singer and Robert B. Ruddell (Editors), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970, Pp. 98-119.

Athey, Irene J.
Language models and reading. Reading Research Quarterly, 7, 1971, Pp. 9-110.

Athey, Irene J. and Holmes, Jack A.
Reading Success and Personality Characteristics in Junior High School Students. Berkeley: University of California Press, 1969.

Bayley, Nancy
Consistency and variability in the growth of intelligence from birth to eighteen years. Journal of Genetic Psychology, 75, 1949, Pp. 165-196.

Baratz, Joan
Teaching reading in an urban Negro school system. In Joan Baratz and Roger Shuy (Editors), Teaching Black Children to Read. Washington, D.C.: Center for Applied Linguistics, 1969.

Baratz, Joan
A review of research on the relationship of Black English to reading. Paper presented at International Reading Association's Annual meeting, Atlantic City, 1971.

Baratz, J. and Shuy, R.W.
Teaching Black Children to Read. Washington, D.C.: Center for Applied Linguistics, 1969.

Bellugi, V.
The development of interrogative structure in children's speech functions. In K. Riegel (Editor), The Development of Language Functions. Ann Arbor: University of Michigan Press, 1965.

Bernstein, B.
Language and social class. British Journal of Sociology, 11, 1960, Pp. 271-276.

Biemiller, A.J. and Levin, H.
Studies of oral reading, II, Pronounceability. In H. Levin, E.J. Gibson, and J.J. Gibson (Editors), The Analysis of Reading Skill, A Program of Applied and Basic Research Theory. New York: Cornell University, 1968, Pp. 116-125.

Bloomfield, Leonard
Language. New York: Henry Holt and Co., 1933.

Bloomfield, L.
Linguistics and reading. Elementary English Review, 19, 1942, Pp. 125-130; 183-186.

Bond, Guy L.
The Auditory and Speech Characteristics of Poor Readers. Teachers College Contributions to Education, No. 657, 1935.

Bond, Guy L. and Dykstra, Robert
The cooperative research program in first grade reading instruction. Reading Research Quarterly, 2, 1967, Pp. 5-142.

Bower, Thomas G.R.
Reading by eye. In Harry Levin and Joanna Williams (Editors), Basic Studies in Reading. New York: Basic Books, 1970.

Braine, M.D.
The ontogeny of English phrase structure: the first phase. Language, 39, 1963, Pp. 1-13.

Brown, E.R.
Bases of reading acquisition. Reading Research Quarterly, 6, 1970, Pp. 49-74.

Bruner, J.S., Olver, R.R., and Greenfield, P.M.
Studies in Cognitive Growth. New York: Wiley, 1966.

Buswell, Guy T.
Non-Oral Reading--A Study of Its Use in the Chicago Public Schools. Chicago: University of Chicago Press, 1945.

Carroll, J.B.
Some neglected relationships in reading and language learning. Elementary English, 43, 1966, Pp. 577-582.

Chomsky, Carol
Reading, writing, and phonology. Harvard Educational Review, 40 (May), 1970, Pp. 287-309.

Chomsky, Carol
Stages in language development and reading exposure. Harvard Educational Review, 42, 1972, Pp. 1-33.

Chomsky, Noam
Syntactic Structures. The Hague: Mouton, 1957.

Chomsky, Noam
Phonology and reading. In Harry Levin and Joanna Williams (Editors), Basic Studies on Reading. New York: Basic Books, 1970, Pp. 3-18.

Chomsky, N. and Halle, M.
The Sound Pattern of English. New York: Harper and Row, 1968.

Corder, Reginald
The Information Base for Reading. Final Report, Project No. 0-9031, U.S. Office of Education, National Center for Educational Research and Development, 1971.

Cramer, R.L.
Dialectology--a case for language experience. Reading Teacher, October, 1971, Pp. 33-39.

Cronnel, B.A.
Spelling-to-sound correspondences for reading v.s. sound-to-spelling correspondences for writing. Paper read at the American Educational Research Association, New York, February, 1971.

Crowl, T.K. and MacGinitie, W.H.
White teachers' evaluations of oral responses given by white and Negro ninth-grade males. Proceedings of the 75th Annual Convention, American Psychological Association, 1970.

Davis, Fred (Editor)
The Literature of Research in Reading with Emphasis on Models. New Brunswick, New Jersey: Rutgers University, 1971.

Entwisle, Doris R.
Implications of language socialization for reading models and for learning to read. In Fred Davis (Editor), The Literature of Research in Reading w th Emphasis on Models. New Jersy: Rutgers University, 1971, Pp. 101-158.

Ervin-Tripp, S.M.
Discourse agreement: how children answer questions. In J.R. Jayes (Editor) Cognition and the Development of Language. New York: Wiley, 1970.

Ervin, Susan M. and Miller, W.R.
Language development. Sixty Second Yearbook of the National Society for the Study of Education, Part I. Chicago: University of Chicago Press, 1963, Pp. 108-143.

Feeley, Joan T.
Teaching non-English speaking first graders to read. Elementary English, 47, 1970, Pp. 199-208.

Fendrick, P.
Visual Characteristics of Poor Readers. Teachers College Contributions to Education, No. 656, 1935.

Flavell, John H.
The Developmental Psychology of Jean Piaget. Princeton, New Jersey: Van Nostrand, 1963.

Fries, C.C
Linguistics and Reading. New York: Holt, Rinehart, and Winston, 1963.

Gelb, I.J.
A Study of Writing, Second Edition. Chicago, Illinois: University of Chicago Press, 1963.

Gibson, Eleanor J.
Learning to read. In H. Singer and R. Ruddell (Editors) Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970, Pp. 315-334.

Gilbert, D.W.
Power and Speed in Reading. Englewood Cliffs, New Jersey: Prentice Hall, 1956.

Gillooly, William B.
The influence of writing system characteristics on learning to read. In Fred Davis (Editor), The Literature of Research in Reading with Emphasis on Models. New Brunswick, New Jersey: Rutgers University, 1971, Pp. 7; 21-44.

Goodman, K.S.
Dialect barriers to reading comprehension. Elementary English, 42, 1965, Pp. 853-860.

Goodman, K.S.
A psycholinguistic view of reading comprehension. In George B. Schick and Merrill M. May (Editors), New Frontiers in College-Adult Reading, Fifteenth Yearbook of the National Reading Conference. Milwaukee, Wisconsin: The National Reading Conference, 1966, Pp. 188-196.

Goodman, Kenneth S.
Reading: a psycholinguistic guessing game. In H. Singer and R. Ruddell (Editors), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970 (a). Pp. 259-272.

Goodman, K.S.
Comprehension-centered reading. Claremont Reading Conference, Thirty-Fourth Yearbook, 1970 (b), Pp. 125-134.

Goodman, K.S.
The reading process: theory and practice. In Richard Hodges and E. Hugh Rudorf (Editors), Language and Learning to Read. New York: Houghton Mifflin, 1972, Pp. 143-159.

Hochberg, J.
Components of leteracy: speculations and exploratory research. In H. Levin and J.P. Williams (Editors), Basic Studies on Reading. New York: Basic Books, 1970, Pp. 74-89.

Hodges, Richard E.
Language development in the school years. In Albert H. Marckwardt (Editor), Linguistics in School Programs. The Sixty Ninth Yearbook of the National Society for the Study of Education, Part II. Chicago, Illinois: University of Chicago Press, 1970, Pp. 215-228.

Holmes, Jack
Factors underlying major reading disabilities at the college level. Genetic Psychology Monographs, 49, 1954, Pp. 3-95.

Huey, E.B.
On the psychology and physiology of reading. American Journal of Psychology, 1901, 12, Pp. 292-313.

Ives, S. and Ives, J.
Linguistics and reading. In A.H. Marckwardt (Editor), Linguistics in School Programs. Chicago: National Society for the Study of Education, 1969.

Labov, William
Stages in the acquisition of standard English. In Roger W. Shuy (Editor), Social Dialects and Language Learning. Champaign, Illinois: National Council of Teachers of English, 1965, Pp. 77-103.

Labov, W.
Some sources of reading problems for Negro speakers of nonstandard English. In J. Baratz and R. Shuy (Editors), Teaching Black Children to Read. Washington, D.C.: Center for Applied Linguistics, 1969.

Labov, W.
The Study of Nonstandard English. Champaign, Illinois: National Council of Teachers of English, 1970.

LeFevre, Carl
Linguistics and the Teaching of Reading. New York: McGraw Hill, 1964.

Lenneberg, E.H.
Biological Foundations of Language. New York: Wiley, 1967.

Loban, Walter D.
The Language of Elementary School Children. Champaign, Illinois: National Council of Teachers of English, 1963.

Lucas, Marilyn S. and Singer, Harry
Dialect in relation to reading achievement: recoding, encoding, or merely a code? Paper read at the California Educational Research Association, 1971.

McCarthy, Dorothea A.
Language development in Children. In L. Carmichael (Editor), Manual of Child Psychology. New York: Wiley, 1954, Pp. 492-630.

Maccorquodale, K.
On Chomsky's review of Skinner's verbal behavior. Journal of Experimental Analysis of Behavior, 13, 1970, Pp. 83-99.

McCullough, Constance M.
What should the reading teacher know about language and thinking. In Richard E. Hodges and E. Hugh Rudorf (Editors), Language and Learning to Read. New York: Houghton-Mifflin, 1972, Pp. 202-215.

McNeil, D.
Developmental psycholinguistics. In F. Smith and G.A. Miller (Editors), The Genesis of Language: A Psycholinguistic Approach. Cambridge, Mass.: M.I.T. Press, 1966, Pp. 15-84.

Martin, Bill
Sounds of Language Readers. See Sounds of Home, Teacher Edition in this series. New York: Holt, Rinehart and Winston, 1966.

Melmed, Paul J.
Black English phonology: the question of reading interference. Monographs of the Language-Behavior Research Laboratory, No. 1, Berkeley: University of California, 1971.

Menyuk, Paula
Syntactic structures in the language of children. Child Development, 34 (June, 1963), Pp. 407-422.

Mitchell-Kernan, C.
Language Behavior in a Black Urban Community. Doctoral Dissertation, University of California, Berkeley, 1969.

Modiano, N.
National or mother language in beginning readers? A comparative study. Research in the Teaching of English, 1968, 1, Pp. 32-43.

Natchez, Gladys
From talking to reading without really trying. The Reading Teacher, 20, 1967, Pp. 339-342.

Piaget, J.
Piaget's theory. In Paul H. Mussen (Editor), Carmichael's Manual of Child Psychology, Vol. I, Third Edition. New York: Wiley, 1970, Pp. 707-732.

Ramirez, M.
The bilingual program bandwagons and the psychodynamics of the Chicano child. Claremont Reading Conference, Thirty-Fourth Yearbook, 1970, Pp. 68-72.

Reed, David
A theory of language, speech, and writing. Elementary English, 1965, 42, Pp. 845-851.

Reed, David
Linguistic forms and the process of reading. In Harry Levin and Joanna Williams (Editors), Basic Studies on Reading. New York: Basic Books, 1970, Pp. 19-29.

Robinson, Francis P.
Effective Study, Revised Edition. New York: Harper, 1961.

Rosen, C.L. and Ortego, P.D.
Issues in language and reading instruction of Spanish speaking children. Newark, Delaware: International Reading Association, 1969.

Rosenblatt, Louise M.
Literature as Exploration. New York: Noble, 1968.

Ruddell, Robert B.
The effect of the similarity of oral and written patterns of language structure on reading comprehension. Elementary English, 42, 1965 (a), Pp. 845-851.

Ruddell, R.B.
The Effect of Four Programs of Reading Instruction with Varying Emphasis on the Regularity of Grapheme-phoneme Correspondence and the Relation of Language Structure to Meaning on Achievement in First Grade Learning. Berkeley: University of California, 1965 (b).

Ruddell, R.B.
Oral language and the development of other language skills. Elementary English, 43, 1966, Pp. 489-498.

Ruddell, R.B.
A Longitudinal Study of Four Programs of Reading Instruction Varying in Emphasis on Regularity of Grapheme-Phoneme Correspondence and Language Structure on Reading Achievement in Grades Two and Three. Berkeley: University of California, 1968.

Ruddell, R.B.
Language acquisition and the reading process. In Harry Singer and Robert B. Ruddell, Theoretical Models and the Processes of Reading. Newark, Delaware: International Reading Association, 1970, Pp. 1-19.

Ruddell, R.B.
Psycholinguistic implications for a systems of communication model. In Harry Singer and Robert B. Ruddell (Editors), Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970, Pp. 239-258.

Ruddell, Robert B. and Williams, Arthur C.
A Research Investigation of a Literacy Teaching Model. Final Report, U.S. Dept. of Health, Education, and Welfare, Office of Education, EPDA Project No. 005262, 1972.

Russell, David H.
The Dynamics of Reading. Edited by Robert B. Ruddell, Waltham, Massuchusetts: Ginn-Blaisdell, 1970.

Rystrom, R.
Negro speech and a reply. Reading Research Quarterly, 1970, 6, Pp. 123-125.

Singer, Harry
Bilingualism and elementary education. Modern Language Journal, 40, 1956, Pp. 444-458.

Singer, H.
Substrata-factor patterns accompanying development in power of reading, elementary through college levels. In E. Thurston and L. Hafner (Editors), Philosophical and Social Bases of Reading. Milwaukee: National Reading Conference, 1964, Pp. 41-56.

Singer,H.
Developmental changes in the subsystems of reading and listening. Paper Abstracts, Washington, D.C.: American Educational Research Association, 1967, P. 127.

Singer, H.
Validity of the Durrell-Sullivan Reading Capacity Test. Journal of Educational and Psycholinguistical Measurement, 23, 1965, Pp. 479-491.

Singer, H.
A developmental model for speed of reading in grades three through six. Reading Research Quarterly, 1, 1965 (b), Pp. 29-49.

Singer, H.
Conceptualization in learning to read. In George B. Schick and Merrill M. May (Editors), Fifteenth Yearbook of the National Reading Conference, 1966, Pp. 116-132.

Singer, H.
Stimulus models for teaching reading. In Margaret M. Clark and Sheena M. Maxwell (Editors), Reading: Influences on Progress, Proceedings of the Fifth Annual Study Congress of the United Kingdom Reading Association, 1968, Pp. 112-119.

Singer, H.
Theoretical models of reading. Journal of Communication, 19, 1969, Pp. 134-156.

Singer, H.
Research that should have made a difference. Elementary English, 47, 1970, Pp. 27-34.

Singer, H.
Theories, models, and strategies for learning to read. In Fred Davis (Editor), The Literature of Research in Reading with Emphasis on Models. New Brunswick, New Jersey: Rutgers University, 1971.

Singer, Harry and Ruddell, Robert B.
Theoretical Models and Processes of Reading. Newark, Delaware: International Reading Association, 1970.

Singer, H.
Review of Ruddell and Williams' Final Report on Literacy Teaching Model. Journal of Reading Behavior, 1972 (in press).

Skailand, Dawn B.
A comparison of four language units in teaching beginning reading. Unpublished doctoral dissertation. Berkeley, California: University of California, 1970.

Slobin, D.I.
The acquisition of Russian as a native language. In F. Smith and G.A. Miller (Editors), The Genesis of Language: A Psycholinguistic Approach. Cambridge, Mass.: M.I.T. Press, 1966. (a)

Slobin, D.I.
Comments on developmental psycholinguistics. In F. Smith and G.A. Miller (Editors), The Genesis of Language: A Psycholinguistic Approach. Cambridge, Mass.: M.I.T. Press, 1966 (b).

Slobin, D.I.
Imitation and grammatical development. In N.S. Endler, L.R. Boulter, and H. Osser (Editors), Contemporary Issues in Developmental Psychology. New York: Holt, Rinehart, and Winston, 1968.

Smith, Frank
Understanding Reading: A Psycholinguistic Analysis Of Reading And Learning To Read. New York: Holt, Rinehart, and Winston, 1971.

Smith, Medorah E.
An investigation of the development of the sentence and the extent of vocabulary in young children. University of Iowa Studies of Child Welfare 3: No. 5, 1926.

Smith, F. and Miller, G.A. (Editors)
The Genesis of Language: A Psycholinguistic Approach. Cambridge, Mass.: M.I.T. Press, 1966.

Staats, A.W. and Staats, C.K.
A comparison of the development of speech and reading behavior with implications for research. Child Development, 1962, 33, Pp. 831-846.

Stewart, W.A.
On the use of Negro dialect in the teaching of reading. In Joan C. Baratz and R.W. Shuy (Editors), Teaching Black Children to Read. Washington, D.C.: Center for Applied Linguistics, 1969.

Strickland, Ruth G.
The Language of Elementary School Children: Its Relationship to the Language of Reading Textbooks and the Quality of Reading of Selected Children. Bulletin of the School of Education, 38 (July, 1962). Bloomington, Ind.: Indiana University.

Strodtbeck, Fred L.
The hidden curriculum in the middle class home. In C.W. Hunnicutt (Editor), Urban Education and Cultural Deprivation. Syracuse, New York: Syracuse University Press, 1964, Pp. 15-31.

Taba, Hilda, Levine, Samuel, and Elzey, Freeman F.
Thinking in Elementary Schod Children. U.S. Office of Education Cooperative Research Project No. 1574. San Francisco, California: San Francisco State College, 1964.

Taba, Hilda
The teaching of thinking. Elementary English, May, 1965, Pp. 534-542.

Venezky, R.L.
English orthography: its graphical structure and its relation to sound, Reading Research Quarterly, 2, 1967, Pp. 75-105.

Venezky, R.L.
Regularity in reading and spelling. In Harry Levin and Joanna Williams (Editors), Basic Studies in Reading. New York: Basic Books, 1970 (a) Pp. 30-42.

Venezky, R.L.
Linguistics and spelling. In Albert H. Marckwardt (Editor), Linguistics in School Programs. The Sixty-Ninth Yearbook of the National Society for the Study of Education, Part II. Chicago, Illinois: University of Chicago Press, 1970 (b), Pp. 264-274.

Wanat, Stanley
Linguistic structure in reading. In Fred Davis (Editor), The Literature of Research in Reading with Emphasis on Models. New Brunswick, New Jersey: Rutgers University, 1971, Pp. 8-155-177.

Wardhaugh, R.
Reading: A Linguistic Perspective. New York: Harcourt, Brace, and World, 1969.

Wardhaugh, R.
Theories of language acquisition in relation to beginning reading instruction. Reading Research Quarterly, 7, 1971, Pp. 168-194.

Weber, R.M.
Some reservations on the significance of dialect differences to the acquisition of reading. Paper read at the International Reading Association, Anaheim, California, 1970 (a).

Weber, R.M.
First graders' use of grammatical context in reading. In Harry Levin and Joanna Williams (Editors), Basic Studies in Reading. New York: Basic Books, 1970 (b), Pp. 147-163.

Wolfram, W.
Sociolinguistic alternatives to teaching reading to non-standard speakers. Reading Research Quarterly, 6, 1970, Pp. 9-33.

Yoes, D.I.
Reading programs for Mexican-American children of Texas. Reading Teacher, June 1967, Pp, 20, 313-318, 323.